Customer No.: 31561
Docket No.: 13794-US-PA
Application No.: 10/711,160

REMARKS

Present Status of the Application

The disclosure was objected to for some informalities, and claim 5 rejected under 35 U.S.C. 112. Under 35 U.S.C. 102(b), claims 8-10 & 12 were rejected as being anticipated by Okamato (US 5,358,807), claims 8-9 rejected by Lin (US 6,010,807) and claims 14-16 rejected by Hsu (US 2003/0077519). Under 35 USC 103(a), claim 17 was rejected as being unpatentable over Hsu, claim 18 rejected over Hsu in view of Chapple-Sokol (US 5,465,859), claim 11 rejected over Okamato or Lin in view of Hsu, claims 11 & 13 rejected over Okamato or Lin in view of Hsu and Yang (US 2005/0048377), claim 19 rejected over Hsu in view of Yang and claims 1-7 rejected over the AAPA in view of Okamato or Lin and further in view of Hsu, Yang and Chapple-Sokol. Claims 8-9 were rejected under 35 U.S.C. 101 as being the same as Lin, and claims 1-7 & 10-19 rejected for obviousness-type double patenting (ODP) as being unpatentable over Lin in view of Okamato, Hsu, Yang & Chapple-Sokol. Claims 1-19 were provisionally rejected for the ODP over copending Application No. 11/161,084 in view of the above cited references.

In response thereto, Applicant has amended the disclosure and claim 5 according to Examiner's opinions, amended independent claims 1, 8 & 14 to overcome both the ODP rejections mainly based on Lin and the rejections under 35 U.S.C. 102(b) & 103(a) and submitted the following remarks, and *have signed a terminal disclaimer to overcome the ODP rejection based on the copending Application No. 11/161,084.* Reconsideration of claims 1-19 is respectfully requested.

Discussions of Rejections under 35 U.S.C. 102(b)

Under 35 U.S.C. 102(b), claims 8-10 & 12 were rejected by Okamato, claims 8-9

rejected by Lin and claims 14-16 rejected by Hsu. Please note that independent claims 8 & 14 have been amended. The amendments can be supported by FIG. 2 (22 covered by 210a; no phase shift region between any two neighboring dense line patterns 220).

Regarding claims 8-10 & 12, a feature of amended independent claim 8 is that the isolated linear pattern on the substrate includes a transparent end portion with a phase shift of 180° relative to the substrate without a phase shift region adjacent to two sides thereof, wherein the transparent end portion is disposed in a manner such that an end of an isolated linear photoresist pattern defined by the isolated linear pattern in a lithography process is covered by the transparent end portion in the lithography process.

Okamato or Lin fails to disclose the above feature of amended claim 8, for at least the reasons below.

First, the isolated linear pattern in Okamato (Figs. 6-7) or in Lin (Figs. 2A-2C) is surrounded by a 180°-shift region; that is, the 180°-shift region is disposed not only at an end of the isolated linear pattern ***but also adjacent to two sides of the same.***

Second, for the 180°-shift region beside the end and the two sides of the isolated linear pattern in Okamato or Lin is intended to improve the contrast in pattern transfer but not to inhibit line-end shortening (LES), in the case of Okamato or Lin, an end of a linear isolated photoresist pattern defined by the isolated linear pattern in a lithography process ***is not covered by the 180°-shift region*** at the end of the isolated linear pattern in the lithography process.

On the other hand, a feature of amended claim 14 is that no phase shift region is present between any two neighboring dense linear patterns.

Hsu fails to disclose the above feature of amended claim 14. As shown in FIG. 8

of Hsu, Hsu's mask is an alternate phase shift mask (Alt-PSM) where zero-shift regions 46 and 180°-shift regions 48 are arranged alternately between the dense line patterns.

For at least the above reasons, Applicant respectfully submits that claims 8 & 14 and claims 9-10, 12 & 15-16 dependent therefrom patently define over the prior art under 35 U.S.C. 102(b).

Discussions of Rejections under 35 U.S.C. 103(a)

Under 35 U.S.C. 103(a), claims 1-7, 11, 13 & 17-19 were rejected over a number of combinations of AAPA, Okamato, Lin, Hsu, Yang and Chapple-Sokol. Please note that independent claim 1 has been amended by including the above feature (no phase shift region between any two neighboring dense linear patterns) newly added to claim 14.

As mentioned above, Okamato or Lin fails to disclose the above feature of amended claim 8 and Hsu fails to disclose the above feature of amended claim 14/1. It is also noted that Okamato or Lin also fails to disclose the above feature of amended claim 14/1, Hsu also fails to disclose the above feature of amended claim 8, and Yang or Chapple-Sokol also fails to disclose any of the above features of amended claims 14/1 & 8.

Moreover, Okamato or Lin also fails to suggest or imply the above feature of amended claim 8 and Hsu also fails to suggest or imply the above feature of amended claim 14 or 1, for at least the reasons set forth. Yang and Chapple-Sokol also fail to suggest or imply any of the above features of amended claims 14/1 & 8 because they are even more uncorrelated with the features.

For the case of Okamato or Lin, since the transparent 180°-shift region is intended to improve the contrast in pattern transfer, it is disposed surrounding the linear pattern but

is not limited to be disposed at an end of the linear pattern, and there is no motivation to modify the 180°-shift region such that an end of an isolated linear photoresist pattern defined by the isolated linear pattern in a lithography process is covered by the 180°-shift region at the end of the isolated linear pattern in the lithography process.

For the case of Hsu, since the 90°-shift regions 49 (=third transparent region in the Abstract) in FIG. 8 of Hsu are intended to effectively cancel *phase conflict (see Abstract) between the zero-shift regions and the 180°-shift regions that would cause ghost lines* but have no LES inhibition function under the condition, in view of Hsu, one of ordinary skilled in the art would have no motivation to apply such 90°-shift regions to a case where no phase conflict is present, such as ***a case where no phase shift region is present between any two neighboring dense linear patterns***.

For at least the above reasons, Applicant respectfully submits that claims 1, 8 & 14 and claims 2-7, 9-13 & 15-19 dependent therefrom all patently define over the prior art.

Discussions of Double Patenting Issues

Claims 8-9 were rejected under 35 U.S.C. 101 as being the same as Lin, and claims 1-7 & 10-19 rejected for obviousness-type double patenting (ODP) as being unpatentable over Lin in view of Okamato, Hsu, Yang & Chapple-Sokol. Claims 1-19 were provisionally rejected for the ODP over copending Application No. 11/161,084 in view of the above cited references.

It is believed that amended claims 1, 8 & 14 are novel and non-obvious over the combinations of the above references, as explained above. Further, Applicants submit herewith a terminal disclaimer pursuant to 37 C.F.R.§1.321(c) with respect to the

co-pending Application NO. 11/161,084. Applicants have submitted the terminal disclaimer solely to advance the prosecution of the application, without conceding that the double patenting rejection is properly based.

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CONCLUSION

In view of the foregoing, it is believed that all pending claims 1-19 are in proper condition for allowance. If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel to arrange for such a conference.

Respectfully submitted,

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